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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,276	10/08/2003	Daniel J. Zierath	42P15930	9335

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EXAMINER
ALEXANDER, MICHAEL P

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 08/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

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Office Action Summary	Application No.	Applicant(s)	
	10/682,276	ZIERATH ET AL.	
	Examiner	**Art Unit**	
	Michael P. Alexander	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2006*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-8* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim(s) 1-8 is/are pending.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 18 May 2006 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Bratin (CONTROL OF TIN AND TIN/LEAD ELECTROPLATING SOLUTIONS BY CYCLIC VOLTAMMETRIC STRIPPING).

Regarding claims 1-2, Bratin teaches (page S16-1-3) a method comprising: determining a concentration of a conductive metal and that the solution would be 10-50% sulfuric acid, which would include low acid electrolytes for electroplating. Bratin further teaches (page S16-1-4) determining the concentrations of the additives, including 20 ml/L of leveler (page S16-1-6) for the low-acid electroplating solution based upon the concentration of the conductive metal. The Examiner asserts that the leveler concentration would inherently be sufficient to reduce a within die thickness variation to a specification value because the electroplating solution would be substantially the same as the claimed electroplating solution.

Regarding claim 3, Bratin teaches (page S16-1-4) determining a concentration of suppressor for the low-acid electroplating solution based upon the concentration of leveler. The examiner asserts that the concentration of suppressor would be sufficient to substantially reduce a plurality of electroplating defects.

Regarding claim 4, the combined concentration of leveler and suppresser would be below 1000 ml/L.

Regarding claim 5, Bratin teaches (page S16-1-6) that the concentration of brightener would be 5 ml/L, which would be a suppressor.

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Kiso (US 4,913,787) in view of Barstad (US 2006/0081475) as evidence.

Regarding claims 1-2, Kiso teaches (col. 3 lines 39-45) a method comprising: determining a concentration of a conductive metal for a low-acid electroplating solution; and determining a concentration of a leveler for the low-acid electroplating solution based upon the concentration of the conductive metal such that the leveler would inherently be sufficient to reduce a within die thickness variation to a specification value, wherein the concentration of thiourea (i.e. leveler) would be 30 g/l (i.e. about 20 ml/l).

Still regarding claims 1-2, the Examiner cites Barstad (paragraph 0041) as evidence that thiourea would be a leveler.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kovarsky (US 2005/0016857).

Regarding claim 1, Kovarsky teaches (0033-0035) a method comprising: determining a concentration of a conductive metal for a low-acid electroplating solution; and determining a concentration of a leveler for the low-acid electroplating solution, wherein the concentration of the leveler is between about 1 mL/L and about 12 mL/L, which overlaps with the claimed range, which is prima facie evidence of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art toe select the desired amount of leveler from the amount disclosed by Kovarsky because Kovarsky teaches the same utility throughout the disclosed range.

With respect to the limitation that the determining of the leveler concentration would be based upon the concentration of the conductive metal in claim 1, the Examiner considers this limitation met by Kovarsky because Kovarsky specifies (0033) a copper concentration for the electrolyte.

With respect to the limitation that the leveler concentration would be sufficient to reduce a within dies thickness variation to a specification value in claim 1, the Examiner notes that the claim does not specify any particular thickness variation maximum, therefore any amount of leveler would satisfy the claimed limitation because the specification value can be considered to include any amount of thickness variation.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun (US 6,808,611).

Regarding claims 1-2, Sun teaches (col. 3 lines 28-31, col. 12 line 67 – col. 13 line 16, col. 15 lines 7-24, col. 19 line 52 – col. 20 line 33) a method comprising: determining the concentration of a conductive metal for a basic (i.e. low acid) electroplating solution; and determining a concentration of a leveler for the low-acid electroplating solution based upon the concentration of the conductive metal, wherein the concentration of the leveler would be between about 0.01 ml/L to about 20 ml/L, which overlaps with the claimed range, which is prima facie evidence of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art to select the desired amount of leveler from the range disclosed by Sun because Sun teaches the same utility throughout the disclosed range.

With respect to the limitation that the leveler concentration would be sufficient to reduce a within dies thickness variation to a specification value in claims 1-2, the Examiner notes that the claim does not specify any particular thickness variation maximum, therefore any amount of leveler would satisfy the claimed limitation because the specification value can be considered to include any amount of thickness variation.

Regarding claim 3, Sun teaches (col. 18 line 25 – col. 19 line 52) determining a concentration of suppressor for the low-acid electroplating solution based upon the concentration of leveler such that the concentration of suppressor is sufficient to substantially reduce a plurality of electroplating defects.

Regarding claim 4, Sun teaches (col. 15 lines 7-24) that the suppressor is determined to be below about 60 ml/L.

Regarding claim 5, Sun teaches (col. 15 lines 7-24) that the suppressor is between about 0.01 and about 60 ml/L, which overlaps with the claimed range, which is prima facie evidence of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art to select the desired amount of suppressor from the range disclosed by Sun because Sun teaches the same utility throughout the disclose range.

Regarding claim 6, Sun teaches (col. 12 lines 67 – col. 13 line 16, col. 15 line 7-24) determining a concentration of a chloride for the low-acid electroplating solution such that the chloride concentration would inherently be sufficient to catalyze the suppressor.

Regarding claim 7, Sun teaches (col. 15 lines 7-24, col. 16 line 9 – col. 18 line 24) determining a concentration of an accelerator for the low-acid electroplating solution based upon the leveler concentration and the suppressor concentration.

Regarding claim 8, Sun teaches (col. 15 lines 7-24) the accelerator concentration is in the range of 0.01 to 25 ml/L, which overlaps with the claimed range, which is prima facie evidence of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art select the desired amount of accelerator from the range disclosed by Sun because Sun teaches the same utility throughout the disclosed range.

Response to Arguments

Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Alexander whose telephone number is 571-272-8558. The examiner can normally be reached on M-F 10:00 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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